

Distinct Horizon

August 2020

Navigation map for Agricultural Startups to augment themselves with Government policies and provisions



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1. Introduction

The agriculture and allied sector continues to be significant for the inclusive and sustainable growth of the Indian economy. Agriculture is the primary source of livelihood for about 58 per cent of India's population. Gross Value Added by agriculture, forestry and fishing is estimated at Rs 18.55 lakh crore (US\$ 265.51 billion) in FY19. The Indian food industry is poised for huge growth, increasing its contribution to world food trade every year due to its immense potential for value addition, particularly within the food processing industry. India is expected to achieve the ambitious goal of doubling farm income by 2022. The agriculture sector in India is expected to generate better momentum in the next few years due to increased investments in agricultural infrastructure, such as irrigation facilities, usage of powered machinery, warehousing and cold storage.

1.1 Current Scenario of Agriculture in India

Indian agriculture is approaching an important crossroad. Based on the sector's current trajectory, the demand-supply mismatch in crops is likely to hit more than 15% by 2020, with the gap worsening to 20-25% by 2025 if unaddressed. The underlying trends (input variables if you will) are equally distressing. Agricultural productivity levels have been stagnant for the past 10 to 15 years, with our crops requiring around two to four times the average global water intensity. Farmers' income has not been able to keep pace. More than a third of farmer households today live below the poverty line. These distressing trends highlight the enormity of the challenges lying ahead for the Indian agricultural industry. "The NITI Aayog recently highlighted that the sector is 28 years behind its time".

1.2 Agricultural Mechanisation in India

Mechanisation of farms indicates the use of machines for conducting agricultural operations replacing the traditional methods which involve human and animal labour. In India, the progress of mechanisation of farms has received a boost during the post-green revolution period. The progress of farm mechanisation in India can be revealed from the table.

<i>Items</i>	<i>1961</i>	<i>1971</i>	<i>1981</i>	<i>1991</i>
1. Gross cropped area (lakh hectares)	1,528	1,658	1,750	1,825
2. Tractors :				
(a) Cumulative totals (lakhs)	0.31	1.00	4.73	14.50
(b) Per lakh hectares of gross cropped area	20	60	279	710
3. Oil Engines :				
(a) Cumulative totals (lakhs)	2.30	—	29.00	48.50
(b) Per lakh hectares of gross cropped area	151	—	1,657	2,575
4. Irrigation pumps electrically operated tubewells/pumpsets				
(a) Cumulative total (lakh)	2.00	13.54	40.00	91.00
(b) Per lakh hectares of gross cropped area	131	817	2,286	4,658
5. Consumption of powers (kWh) for agriculture per thousand hectares of gross cropped area	5.5	23.0	71.0	259.7

- Department of Agriculture & Cooperation has integrated the components of agricultural mechanization under various schemes and programmes aiming at catalyzing an accelerated but inclusive growth of agricultural mechanization in India. The following specific interventions with a special emphasis on ‘reaching the unreached’ will bring small and marginal farmers’ at the core. With this aim **Sub Mission on Agricultural Mechanization (SMAM)** was introduced during 12th plan w.e.f April 2014.

2. Government Initiatives for Mechanisation (Schemes & Policies)

2.1 Sub Mission on Agricultural Mechanization (SMAM):

Division introduced Sub Mission on Agricultural Mechanization with following components;

1. Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration: Aims to ensure performance testing of agricultural machinery and equipment, capacity building of farmers and end users and promoting farm mechanization through demonstrations.

Table 8

Particular	Quantum
Demonstration	100% assistance @ ₹ 4000 per hectare upto 100 ha per season
Training	₹ 25.0 Lakh per State per year.
Testing	₹ 1.5 Crore per centre.

2. Demonstration, Training and Distribution of Post Harvest Technology and Management (PHTM): Aims at popularizing technology for primary processing, value addition, low cost scientific storage/transport and the crop by-product management through demonstrations, capacity building of farmers and end users. Provides financial assistance for establishing PHT units.

3. Financial Assistance for Procurement of Agriculture Machinery and Equipment: Promotes ownership of various agricultural machinery & equipments as per norms of assistance.

4. Establish Farm Machinery Banks for Custom Hiring: Provides suitable financial assistance to establish Farm Machinery Banks for Custom Hiring for appropriate locations and crops.

5. Establish Hi-Tech, High Productive Equipment Hub for Custom Hiring: Provides financial assistance to set up hi-tech machinery hubs for high value crops like sugarcane, cotton etc.

6. Promotion of Farm Mechanization in Selected Villages: Provides financial assistance to promote appropriate technologies and to set up Farm Machinery Banks in identified villages in low mechanized states.

7. Financial Assistance for Promotion of Mechanized Operations/hectare Carried out Through Custom Hiring Centers: Provides financial assistance on per hectare basis to the beneficiaries hiring machinery/equipment from custom hiring centers in low mechanized areas.

8. Promotion of Farm Machinery and Equipment in North-Eastern Region: Extends financial assistance to beneficiaries in high-potential but low mechanized states of north-east.

Out of the above mentioned components, 1& 2nd comes under Central Sector (Central share 100%) and remaining (3to 8) under Central Sponsored Scheme (central share: 60%, State Share: 40%).

2.1.2 CUSTOM HIRING CENTRES:

Efficient machinery helps in increasing production and productivity, besides enabling the farmers to raise a second crop or multi crop making the Indian agriculture attractive and a way of life by becoming commercial instead of subsistence. Increased production will require more use of agricultural inputs and protection of crops from various stresses. At present the farm power availability per ha is 1.84kW/ha (2013-14) which is to increase 4.0 kW/ha by 2022.

This will call for greater engineering inputs which will require developments and introduction of high capacity, precision, reliable and energy efficient equipment. Looking at the pattern of land holding in India, it may be noted that about 84 % of the holdings are below 1 ha. There is a need for special efforts in farm mechanization for these categories of farmers to enhance production and productivity of agriculture. In the existing scenario of land fragmentation and resulting continued shrinkage of average size of operational holdings, the percentage of marginal, small and semi-medium operational holdings is likely to increase. Such small holding makes individual ownership of agricultural machinery uneconomic and operationally unviable. 'Custom Hiring Centers of Agricultural Machineries' operated by Cooperative Societies, Self Help Groups and private/rural entrepreneurs are the best alternative in enabling easy availability of farm machineries to the farmers and bringing about improvement of farm productivity for the benefits of Small & Marginal farmers.

2.1.3 FMTTIs (Farm Machinery Training & Testing Institutes)

With a view to enhance the pace of agricultural mechanization, the Government has laid emphasis to provide financial assistance to the farmers and other target groups for purchase of different kinds of farm equipment, demonstration of new equipment among farmers for spread of new technology, human resource development in operation, maintenance/ repairs and management of agricultural machinery and the quality improvement through testing and evaluation besides institutional credit & fiscal measures. The Farm Machinery Training & Testing Institutes at Budni (M.P.), Hissar (Haryana), Garladinne (A.P.) and Bishwanath Chariali (Assam) established by the Government have played a vital role in promoting agricultural mechanization. The Farm Machinery Training & Testing Institutes contribute in the promotion of agricultural mechanization in terms of Human Resource Development, Test and Performance evaluation of agricultural machinery to assess their functional suitability.

2.2 National Initiative for Climate Resilient Agriculture (NICRA)

National Innovations on Climate Resilient Agriculture (NICRA) is a network project of the Indian Council of Agricultural Research (ICAR) launched in February, 2011. The project aims to enhance resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration.

The project consists of four components:

- 1) Strategic Research,
- 2) Technology Demonstration,
- 3) Capacity Building
- 4) Sponsored/Competitive Grants.

2.2.1 Technology Demonstration:

The technology demonstration component consists of the following partners:

- 1.KVKs in eight zones -121
- 2.Co-operating centres of AICRP on Dryland Agriculture - 23
- 3.Technology Transfer Divisions of Core Institutes – 7

Under this component, an integrated package of proven technologies would be demonstrated in one village panchayat in each district for adaptation and mitigation of the crop and livestock production systems to climate variability based on the available technologies. These districts are selected based on the following criteria besides the strength of the KVKs:

- Drought proneness based on 30 years rainfall data (Source : IMD)
- Cyclone proneness based on frequency as recorded by IMD/State Disaster Management agencies.
- Flood proneness based on IMD data and NDMA maps.

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- Vulnerability to heat wave and cold wave based on IMD grid data on temperatures.
 - Actual incidence of floods and droughts as recorded by AICRPAM centers

The interventions of NICRA cover the following four modules:

Module I : Natural resources: This module consists of interventions related to in-situ moisture conservation, water harvesting and recycling for supplemental irrigation, improved drainage in flood prone areas, conservation tillage where appropriate, artificial ground water recharge and water saving irrigation methods.

Module II : Crop Production: This module consists of introducing drought/temperature tolerant varieties, advancement of planting dates of rabi crops in areas with terminal heat stress, water saving paddy cultivation methods (SRI, aerobic, direct seeding), frost management in horticulture through fumigation, community nurseries for delayed monsoon, custom hiring centres for timely planting, location specific intercropping systems with high sustainable yield index.

Module III : Livestock and Fisheries

Module IV : Institutional Interventions: This module consist of institutional interventions either by strengthening the existing ones or initiating new ones

2.2.2 Outcomes in the Past

The project has made a significant initial impact and was well received in most of the districts. Technologies such as on-farm water harvesting in ponds, supplemental irrigation, introduction of early maturing drought tolerant varieties, paddy varieties tolerant to submergence in flood prone districts, improved drainage in water logged areas, recharging techniques for tube wells, site specific nutrient management and management of sodic soils, mulching, use of zero till drills were enthusiastically implemented by the farmers in NICRA villages across the country.

3. Involvement of Government Bodies

Government support is essential in transforming the agribusiness sector. Political will and cooperation have been a critical component of all agricultural revolutions. Government being the most important stakeholder in implementing agriculture policies and supporting farmers is considered as the most crucial route for agri startup. With various policies, subsidies and farmer welfare programmes, the government and various central level organisations have played a vital role in enhancing the condition of farmers and in tackling various issues that have come up now and then. Hence, an understanding of various government organisations and their interest is essential for any agri startup to scale faster and reach the target customer, i.e. farmers.

3.1 Government Organisations

As already mentioned, agriculture is the primary source of livelihood for about 58 per cent of India's population. Hence, understanding how important it is to monitor and understand the agriculture landscape has been a priority for the government. As a result, a number of central level organisations have been active in strategizing and implementing various policies and ideas to better the situation of farmers, increase productivity, increase variability in production and in turn bring more prosperity to the larger section of Indian population. These organisations have their goals and activities laid out clearly and function in a way to reach maximum farmers and impact their lives to the best extent possible. Hence, this can be one potential route for startups to scale. Engaging with these organisations would not only enhance the reach of these startups but also might result in financial assistance, incubation, mentorship and other potential following engagements with various state level organisations. Few of such organisations of importance include SFAC, NITI Ayog, Invest India etc.

3.1.1 Small Farmers' AgriBusiness Consortium (SFAC)

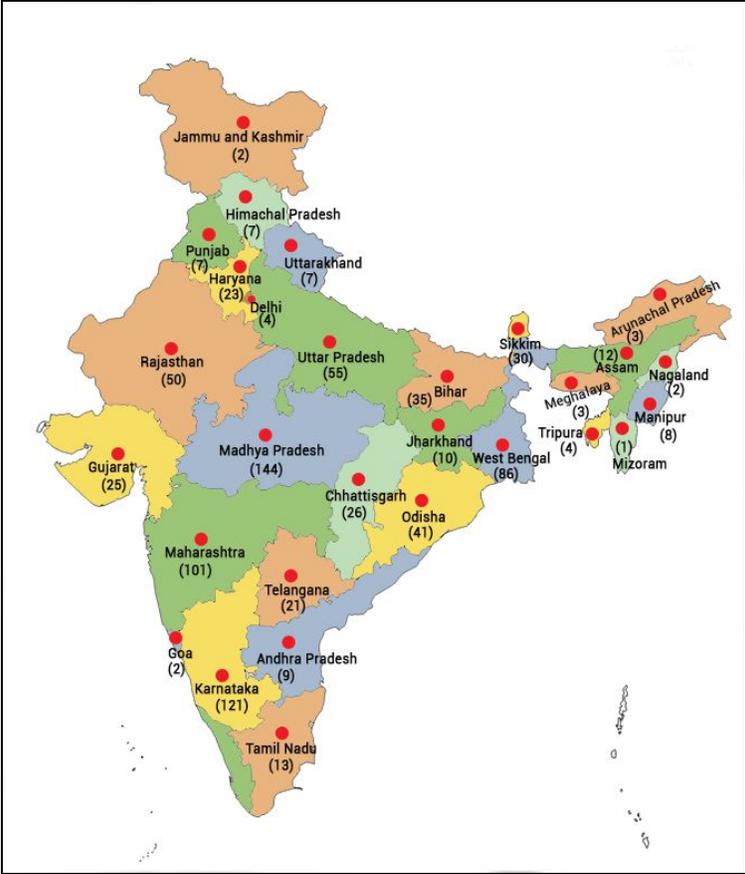
SFAC is the organisation implementing the central schemes of Government of India namely VCA(Venture Capital Assistance scheme), EGCGF(Equity grant and credit guarantee fund scheme) for inclusion of small and marginal farmers in agribusiness activities.

Society plays an important role in organising small and marginal farmers as Farmers Interest Groups, Farmers Producers Organisation and Farmers Producers Company for endowing

them with bargaining power and economies of scale. SFAC provides a platform for increased accessibility and cheaper availability of agricultural inputs to small and marginal farmers and in establishing forward and backward linkages in supply chain management. Four key schemes led by SFAC are FPO scheme, VCA scheme, NAM and EGCGF scheme. In addition, SFAC is also the organisation for approving any PPP(Public private partnership) program in the agriculture sector(PPPIAD) under the RKVY scheme. For an agritech startup, it becomes necessary to study an organisation of such a huge importance and identify the right ways to engage. The first step in this would be to identify the key schemes that can help the startup in scaling, outreach, finances etc. Three such potential domains are explained below:

❖ **Farmer Producer Organisations Schemes(FPO Schemes)**

An FPO is a registered body with farm producers as shareholders in the organisation. It deals with business activities related to the farm produce and works for the benefit of the member producers. Throughout India, there are around 851 FPOs supported by SFAC.



Hence, FPO scheme can be considered as the most elemental scheme and a way ahead for startups to reach all the government supported Farmer Producer Organisations.

State Level Producer Companies(SLPCs)

An initiative has been taken to establish State Level Federations of FPOs to create a State level umbrella support for the member FPOs. **8 such State Level Producer Companies (SLPCs)** are supported in the States of Madhya Pradesh, Rajasthan, Maharashtra, Gujarat, Tamil Nadu, Uttar Pradesh, Telangana and West Bengal.

❖ Venture Capital Assistance Scheme(VCA)

Venture Capital Assistance is financial support in the form of an interest free loan provided by SFAC to qualifying projects to meet the shortfall in the capital requirement for implementation of the project. The specifics of this scheme as given in the official guidelines is given below:

Qualifying projects under Venture Capital:

1. Project should be in agriculture or allied sector or related to agricultural services. Poultry and dairy projects will also be covered under the Scheme.
2. Project should provide assured market to farmers/producer groups.
3. Project should encourage farmers to diversify into high value crops, to increase farm incomes.
4. Project should be accepted by Notified Financial Institution for grant of term loan.

The **quantum of SFAC Venture Capital Assistance** will depend on the project cost and **will be the lowest of the following:**

1. 26% of the promoter's equity
2. 50.00 lakhs. Provided that for projects located in North-Eastern Region, Hilly States (Uttarakhand, Himachal Pradesh, Jammu & Kashmir) and in all cases in any part of the country where the project is promoted by a registered Farmer Producers Organisation, the quantum of venture capital will be the lowest of the following:
3. 40% of the promoter's equity
4. 50.00 lakhs.

SFAC seems to be a highly relevant organisation because of the fact that it is the prime organisation implementing FPO Scheme at Central level and is directly associated with the FPOs and SLPCs. Hence, engaging with SFAC should be considered a high priority task for the startup to connect with the numerous FPOs and FPCs across the nation.

3.1.2 NITI Aayog

NITI Aayog has been constituted to actualize the important goal of cooperative federalism and to enable good governance in India to build a strong nation state. Two key features of Cooperative Federalism are: joint focus on the national development agenda by the Centre and States; and advocacy of State perspectives with Central Ministries.

NITI Aayog has also established models and programmes for the development of infrastructure and to reignite and establish Private Public Partnership, such as the Centre-State partnership model: Development Support Services to States (DSSS); and the Sustainable Action For Transforming Human Capital (SATH) programme which is designed to help States improve their social sector indicators by providing them technical support.

KEY ELEMENTS / VERTICALS RELEVANT TO ANY AGRICULTURE STARTUP:

➤ ***Atal Innovation Mission[AIM]:***

The Atal Innovation Mission (AIM) is a flagship initiative set up by the NITI Aayog to promote innovation and entrepreneurship across the length and breadth of the country, based on a detailed study and deliberations on innovation and entrepreneurial needs of India in the years ahead.

Relevant pointers/areas AIM focusses on:

ATAL Incubators: AIM is setting up world-class **Atal Incubators (AICs)** that would trigger and enable successful growth of sustainable startups in every sector /state of the country. AIM is providing a grant of **upto Rs 10 crores to successful applicants** for setting up greenfield incubators or scaling up existing ones.

ATAL NEW INDIA CHALLENGE:

The Atal New India Challenge is an open call to design and demonstrate market-ready products based on cutting edge technologies in identified focus areas. Applicants showing capability, intent, and promise to be able to productize technologies will be awarded grants of upto 1 crore, strictly on a milestone basis.

➤ **Agriculture Vertical :**

The Agriculture vertical at NITI Aayog works to develop plans and policies for the development of agriculture, animal husbandry, dairy, fisheries, agricultural land policies and food processing for farmers' welfare. It works in close coordination with the line departments of Central Ministries as well as States.

Relevant pointers/areas the agriculture vertical focussed on:

- Business Model for Doubling of Farmers' Income
- Agriculture key for promoting inclusive growth
- Operation Green
- Promotion of Zero Budget Natural Farming:
- Agriculture subsidy on area basis

➤ **Private Public Partnership**, such as the Centre-State partnership model: Development Support Services to States (DSSS); and the Sustainable Action For Transforming Human Capital (SATH) programme which is designed to help States improve their social sector indicators by providing them technical support.

NITI AYOOG seems a relevant organisation and one should not fail to reach out to them if they have a high impact agritech project proposal for any possible intervention being it Atal Innovation Mission, Grand Challenge, Agriculture Vertical or PPP.

3.2 Social Impact Bonds

A social impact bond (SIB) is a contract with the public sector or governing authority, whereby it pays for better social outcomes in certain areas and passes on the part of the savings achieved to investors. A social impact bond can be a way out for an agritech startup to connect with public sector authorities in a mutually beneficial agreement wherein one party enables betterment of farmers and the other party provides support to fulfill its vision and objectives through first party's services.

One such Social Impact Bond researched is Lakhpati Kisan Bond. It is a flagship initiative of TATA Trust which focuses on the tribal belts in central India. It strives to bring households irreversibly out of poverty with increased life choices.

Key highlights of Lakhpati Kisan Bond:

Collectives for Integrated Livelihood Initiatives (CINI): A nodal agency of the Trusts, promotes various livelihood prototypes in agriculture, livestock and non-timber forest produce, and water resource development. The programme engages with **100,000 households in 45 districts across four states – Jharkhand, Odisha, Maharashtra and Gujarat.** The objective was to bring about irreversible change in the central Indian tribal belt through economic empowerment and improving the quality of life of tribal communities. **Introduction of technology-led changes**, including sustainable energy solutions such as solar pumps and solar panels, development of the Lakhpati Kisan App and SMC App, use of GIS mapping for cultivated areas, introduction of IT in education, piloting app-based data entry, etc.

This is one example of social impact bonds. There can be numerous such ways of engaging with government or public sector organisations to enable faster scaling of startups across various geographies of the country.

4. Conclusion

Through the course of this document, emphasis has been laid to collate all possible avenues for an Agri-Technology startup for the purpose of scaling their technology throughout the country. Crucial organisations like NITI Aayog, SFAC etc. have been described to help the reader understand their role and involvement in the agriculture sector and how important these can prove in connecting these startups to the right people. Government policies and schemes like RKVY etc. have been discussed in detail to explain the ways in which technology can be brought to the reach of farmers.

